

What is claimed is:

1. A Q-switch laser apparatus to deliver a sequence of laser pulses comprising:
 - a laser cavity formed by a pair of reflective surfaces;
 - a laser gain medium mounted in said laser cavity;
 - optic coupling elements;
 - a continuous optical pump radiation source whose pump radiation is coupled through said coupling elements in said laser gain medium;
 - a quadratic electro-optic Q-switch mounted in said laser cavity;
 - said Q-switch being connected with an electronic unit generating a radio frequency wave with positive and negative pulses alternatively; and
 - said Q-switch being controlled by the radio frequency wave in such a way that laser pulse is generated when the radio frequency wave changes its polarity.
2. The laser apparatus in claim 1 wherein said electro-optic Q-switch comprises a material with quadratic electro-optic coefficient.
3. The Q-switch defined in claim 2 further comprises a ceramic material with quadratic electro-optic coefficient.
4. The Q-switch defined in claim 2 further comprises La modified PMN-PT ceramics.
5. The Q-switch defined in claim 4 further comprises La modified PMN-PT with the composition of 3.5/75/25.
6. The laser apparatus in claim 1 wherein said electro-optic Q-switch operates at a voltage of 500 volts or less.
7. The laser apparatus in claim 1 wherein said electro-optic Q-switch operates at a pulse repetition frequency up to 1MHz.
8. The laser apparatus in claim 1 wherein said electro-optic Q-switch operates at a laser wavelength from 530 nm to 3000nm.
9. The laser apparatus in claim 1 wherein said electro-optic Q-switch comprises a plate of transparent La modified PMN-PT material of a width (w) of about 0.4 – 3 mm, a thickness (t) of about 1.30 – 3 mm, and a length (l) of about 1.0 – 3.0 mm, the plate having an optical axis 45° oriented to a polarization direction of radiation, the plate having electrodes for applying an operating voltage less than 500 volts.
10. A Q-switch laser apparatus to deliver a sequence of laser pulses comprising:

a laser cavity having a pair of reflective surfaces;
a laser gain medium mounted in said laser cavity;
optic coupling elements;
a continuous optical pump radiation source whose pump radiation is coupled through
said coupling elements in said laser gain medium;
a quadratic electro-optic Q-switch mounted in said laser cavity;
said Q-switch being connected with an electronic unit generating a radio frequency
wave with positive and negative pulses alternatively;
said Q-switch being controlled by the radio frequency wave in such a way that laser
pulse is generated when the radio frequency wave changes its polarity; and
a polarizer mounted 45° to the optical axis of said Q-switch.

11. A Q-switch laser apparatus to deliver a sequence of laser pulses comprising:
- a laser cavity having a pair of reflective surfaces;
a laser gain medium mounted in said laser cavity;
a frequency doubling KTP mounted in said laser cavity;
optic coupling elements;
a continuous optical pump radiation source whose pump radiation is coupled through
said coupling elements in said laser gain medium;
a quadratic electro-optic Q-switch mounted in said laser cavity;
said Q-switch being connected with an electronic unit generating a radio frequency
wave with positive and negative pulses alternatively; and
said Q-switch being controlled by the radio frequency wave in such a way that laser
pulse is generated when the radio frequency wave changes its polarity.